9-2002

GEOL 575.01: Clay and Shale

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Clay and Shale - G575 Gray Thompson - Fall, 2002

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Week	**Discussion Topic and (Readings)**	**Lab Topic and (Readings)**
1	Mineralogy review, silicate minerals, clay minerals (Moore & Reynolds(*) Chs 1 & 4)	X-ray diffraction as a mineral identification tool (*Chs 2 & 3)
2	The kaolin and serpentine groups (*138 -145); 2:1 and 2:2 layer silicates (micas, chlorites, others) (*146 - 166)	Sample preparation methods for general mineral identification by X-ray diffraction; operating the X-ray diffractometer
3	Mixed-layer clay minerals. (*167 -188)	Interpreting X-ray diffraction patterns for general mineral identification
4	Mixed-layer clays as MacEwan Crystallites (Reynolds & Hower, 1970, Clays & Clay Minerals pp 25-36 "The Nature of Interlayering..."; vs Fundamental Particles (Nadeau et al, 1984, Science pp 923-925, and Clay Minerals, pp 757-769 - also 1984).	Sample preparation methods for clay mineral identification by X-ray diffraction (*Ch 6)
5	Mixed-layer clays con't	Interpreting X-ray diffraction patterns of clay minerals *Ch 7)
6	Mixed-layer clays con't	NEWMOD interpreting X-ray diffraction patterns of

		simple and mixed-layer clay minerals as MacEwan Crystallites (*Ch 7)
7	Mixed-layer clays con't	NEWMOD con't
8	Mixed-layer clays con't	NEWMOD con't
9	Origins of clay minerals: weathering, neoformation, and hydrothermal alteration (readings from this point on will be listed in a seperate bibliography)	NEWMOD con't
10	Origins of clays con't; clays in transport and deposition	X-ray diffraction interpretations of mixed-layer clays
11	Burial diagenesis - the conversion of mud to shale	Mixed-layer clays con't
12	Burial diagenesis con't	Mixed-layer clays con't
13	Diagenesis and the generation and migration of petroleum	Mixed-layer clays con't
14	Reaction mechanisms of diagenetic mineral reactions	Mixed-layer clays con't
15	Diagenesis to metamorphism	Mixed-layer clays con't

- *Moore & Reynolds, 1997. X-ray diffraction … of Clay Minerals 2nd Ed.
- Course grading is based on three factors:
  1. Participation in lecture discussions based on assigned readings,
  2. Completion of laboratory analyses of assigned samples,
  3. A final research paper based on your analysis of an assigned clay sample(s) and a thorough literature review of the sample(s) and it's occurrence/geologic implications.

September 23 – Last day to add/drop by Cyberbear – Autumn 2002.

October 14 – Last Day to drop/adds (No $$$ Back) – Autumn 2002.